

CLAIMS

1. A superconducting wire comprising a metal substrate and an overlying superconducting layer (3), wherein said metal substrate is a textured metal substrate (1)
5 planarized to have a surface layer extending from a surface thereof to a depth of 300 nm with a crystal axis offset relative to an orientation axis by at most 25°, and a surface roughness R_{p-v} of at most 150 nm.
2. The superconducting wire according to claim 1, wherein said textured metal
10 substrate (1) underlies an intermediate layer (2) and said intermediate layer (2) underlies said superconducting layer (3).
3. A method of producing a superconducting wire, comprising the steps of:
planarizing a textured metal substrate (1) to have a surface layer extending from
15 a surface thereof to a depth of 300 nm with a crystal axis offset relative to an orientation axis by at most 25°, and a surface roughness R_{p-v} of at most 150 nm; and
depositing a superconducting layer (3) on said textured metal substrate planarized.
- 20 4. The method according to claim 3, further comprising the step of thermally treating said textured metal substrate (1) in a reducing atmosphere at least once after the step of planarizing said textured metal substrate (1) and before the step of depositing said superconducting layer (3) on said textured metal substrate (1) planarized.
- 25 5. The method according to claim 3, further comprising the step of thermally treating said textured metal substrate (1) in a vacuumed atmosphere at least once after the step of planarizing said textured metal substrate (1) and before the step of depositing said superconducting layer (3) on said textured metal substrate (1) planarized.

6. The method according to claim 3, wherein the step of planarizing said textured metal substrate (1) is performed by at least one of: mirror finished rolling; mechanochemistry; electrolytic polishing; and chemical polishing.

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7. The method according to claim 6, further comprising the step of thermally treating said textured metal substrate (1) in a reducing atmosphere at least once after the step of planarizing said textured metal substrate (1) and before the step of depositing said superconducting layer (3) on said textured metal substrate (1) planarized.

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8. The method according to claim 6, further comprising the step of thermally treating said textured metal substrate (1) in a vacuumed atmosphere at least once after the step of planarizing said textured metal substrate (1) and before the step of depositing said superconducting layer (3) on said textured metal substrate (1) planarized.

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9. The method according to claim 3, further comprising the steps of:
depositing an intermediate layer (2) on said textured metal substrate (1); and
depositing said superconducting layer (3) on said intermediate layer (2).

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10. The method according to claim 9, further comprising the step of thermally treating said textured metal substrate (1) in a reducing atmosphere at least once after the step of planarizing said textured metal substrate (1) and before the step of depositing said intermediate layer (2) on said textured metal substrate (1) planarized.

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11. The method according to claim 9, further comprising the step of thermally treating said textured metal substrate (1) in a vacuumed atmosphere at least once after the step of planarizing said textured metal substrate (1) and before the step of depositing said intermediate layer (2) on said textured metal substrate (1) planarized.

12. The method according to claim 9, wherein the step of planarizing said textured metal substrate (1) is performed by at least one of: mirror finished rolling; mechanochemistry; electrolytic polishing; and chemical polishing.

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13. The method according to claim 12, further comprising the step of thermally treating said textured metal substrate (1) in a reducing atmosphere at least once after the step of planarizing said textured metal substrate (1) and before the step of depositing said intermediate layer (2) on said textured metal substrate (1) planarized.

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14. The method according to claim 12, further comprising the step of thermally treating said textured metal substrate (1) in a vacuumed atmosphere at least once after the step of planarizing said textured metal substrate (1) and before the step of depositing said intermediate layer (2) on said textured metal substrate (1) planarized.

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